



Maneuver Support Center



SCRAPER PHASE

- SAFETY!!!
- Jewelry
- Horseplay
- Weapons
- Break Area
- Smoke Area
- UXO
- Sleeping
- Water
- Medication

SCRAPER PHASE

- Latrines!
- Severe Weather
- Eating in Classroom
- Reading Material
- POL
- EPA
- Instructors Office
- Clean-up
- Hard Hats
- Class Leader Responsibilities



Maneuver Support Center



Caterpillar

621-B

Scraper





Action: Operate a Motorized Scraper

Condition: In a classroom and at a designated training area, given a motorized scraper, a crawler tractor, FM 5-434, TM 5-2410-237-10, TM 5-3805-248-14&P-1, P-3, LO 5-2410-237-12, a general mechanics tool kit, appropriate maintenance forms, an equipment record folder, petroleum, oil, lubricants, goggles, gloves, hearing protection, hard hat, paper, and a pencil.

Standard: Perform operator's maintenance checks and services, excavate material, spread material, and pusher assisted loading in accordance with FM 5-434, TM 5-2410-237-10, TM 5-3805-248-14&P-1, P-3, LO 5-2410-237-12, without damage to equipment or the environment and without **injury to**

Scope: The purpose of this lesson is to prepare to understand the technical lessons that will follow. This lesson will include a briefing on characteristics, major components, controls and instruments and uses of the motorized equipment.

Safety: All students will wear hearing protection and seat belts when operating equipment. Do not wear loose clothing or any jewelry (dog tags, rings or watches) on or around equipment.

Environmental: Considerations should be made for all ground erosion, stressed vegetation and contaminated soil.

These could Result from operator negligence


ALL FEDERAL LAWS APPLY !

Risk assessment: Low

Objectives

- 1. Preventive Maintenance**
- 2. Pusher assist**
- 3. Excavate materials**
- 4. Spread materials**



- 
- 1. General Description**
 - 2. Capabilities**
 - 3. Limitations**
 - 4. Characteristics**
 - 5. Components**
 - 6. Operator techniques**

Caterpillar 621-B Scraper



**Earthmoving
Pusher
Assisted**



Motorized

General description of Caterpillar 621-B Scraper



**Motorized single axle
tractor**



Bowl/pan with spindle mounted rear



Semi-automatic transmission



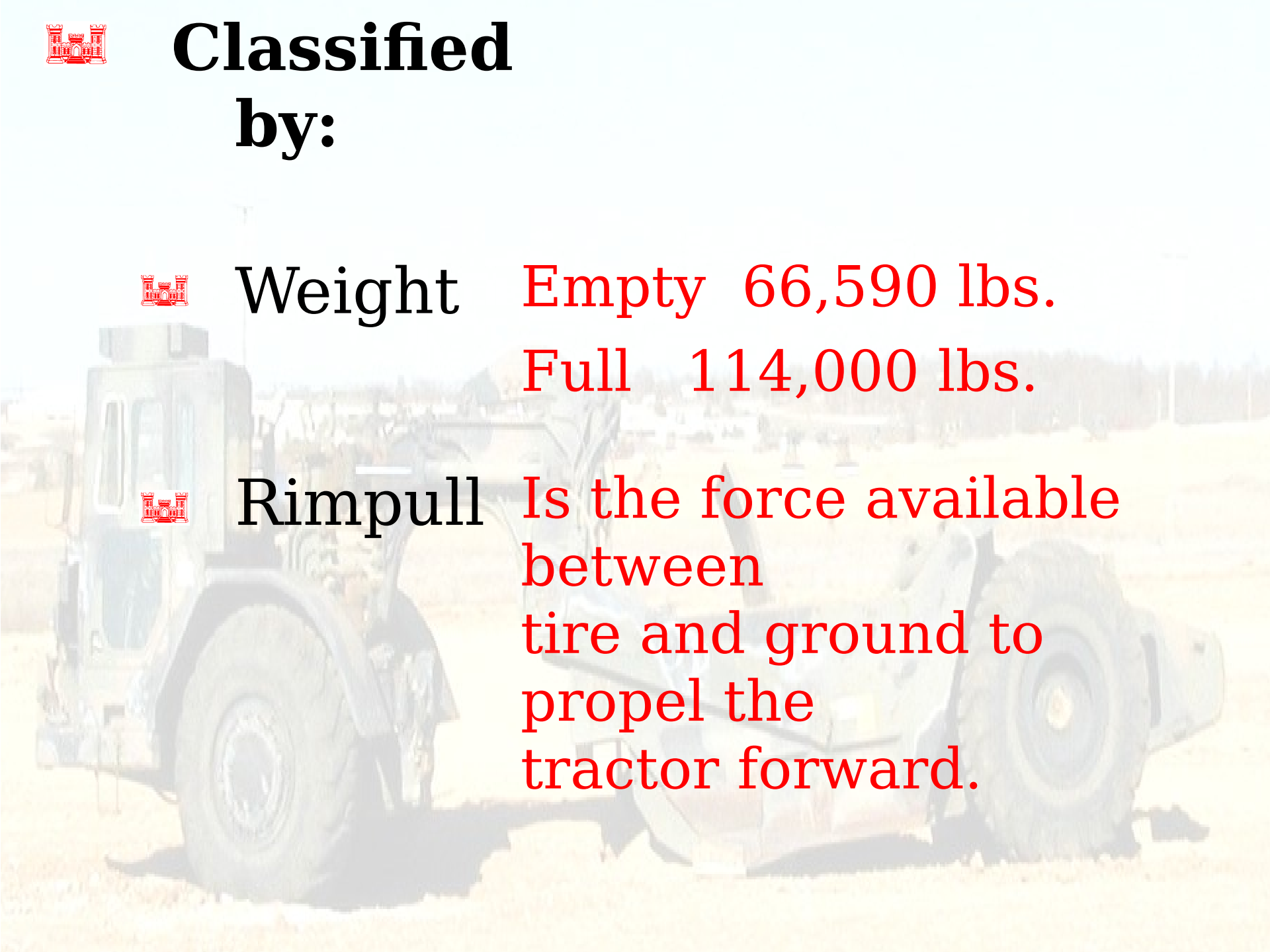
Classified by:



Weight Empty 66,590 lbs.
Full 114,000 lbs.



Rimpull Is the force available
between
tire and ground to
propel the
tractor forward.





Capabilities :



All weather operation



High ground clearance of 18



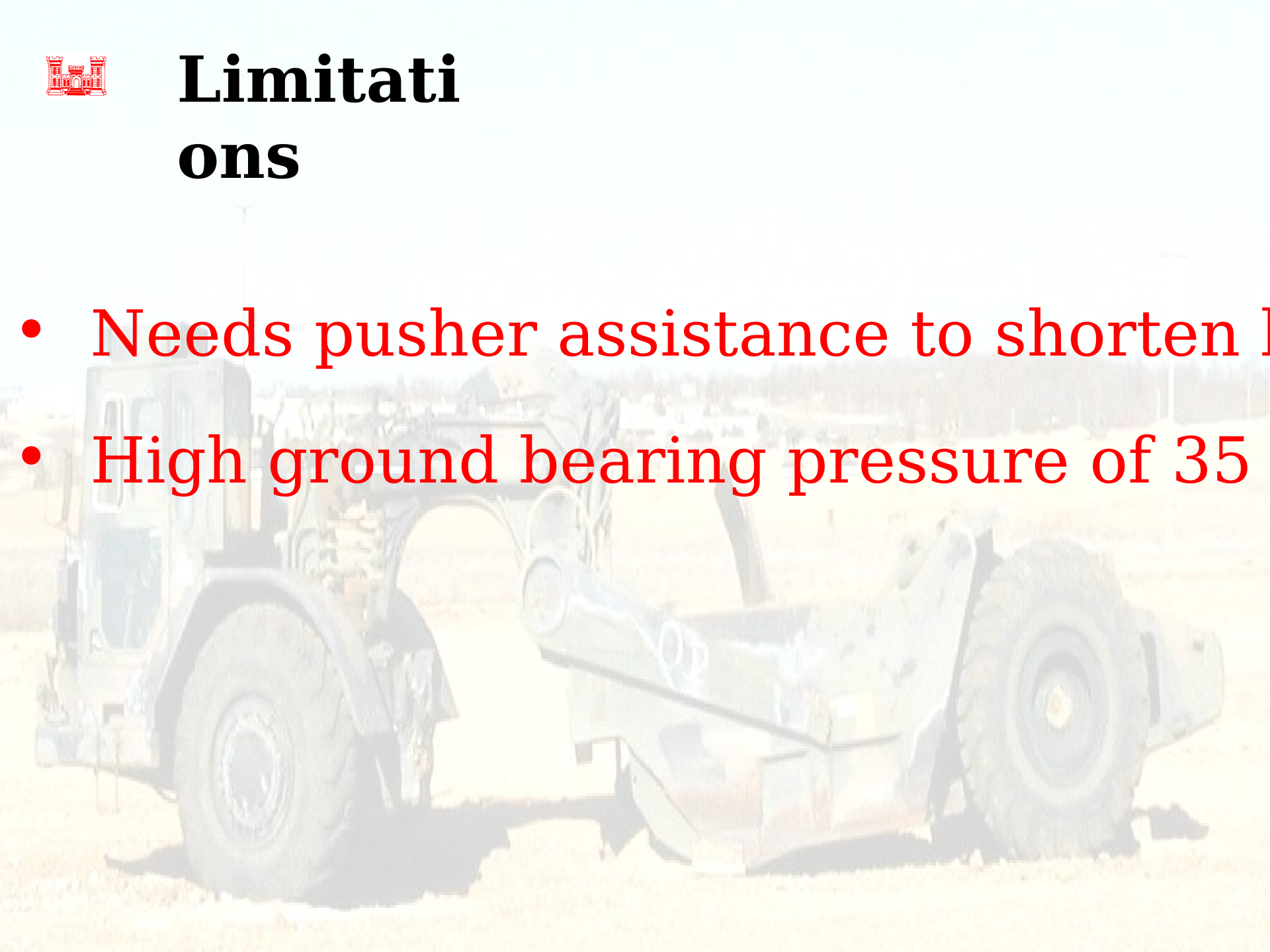
**Adjustable cutting
edges**





Limitations

- Needs pusher assistance to shorten l
- High ground bearing pressure of 35



Characteristics:



Turning Radius 18 ft. 3 in.



U-Turn 36 ft. 6 in.





Haul



Maximum Speed 31 MPH



Distance 300 ft. To 5000 ft. optimal



**Hauling distances should be kept short
Prolong equipment life and conserve**





Bowl Capacities & Character

- **Struck 14 cubic yards**



- **Heaped 18 cubic yards**



A close-up photograph of the adjustable cutting edges of a moldboard plow. The plow is shown in operation, cutting through dark, moist soil. The cutting edges are made of metal and are secured with bolts. A yellow text overlay at the top right reads "Change out when 1" From moldboard". At the bottom, there is a blue text overlay "Router E" and a black text overlay "Adjustable Cutting Edges". A small red logo is visible in the bottom left corner. Three black arrows point to the cutting edges, and a blue arrow points to the router bit.

**Change out when 1"
From moldboard**

Router E

Adjustable Cutting Edges





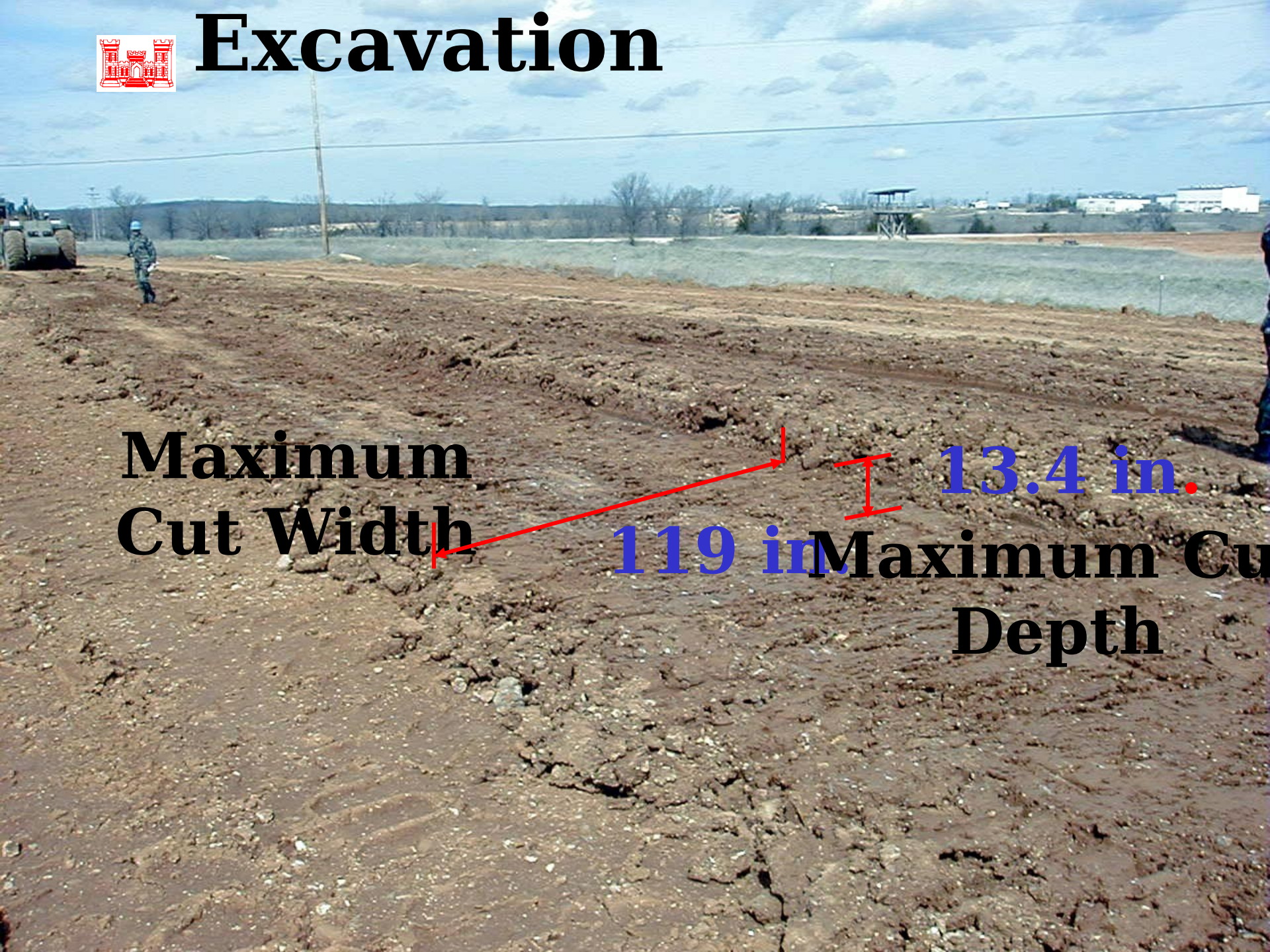
Excavation

**Maximum
Cut Width**

119 in

13.4 in.

**Maximum Cut
Depth**





Penetration

Stinger Bit



Spread Depth of 18 inches



and depth will increase to a Max of 36 in. when rear wheels reach and climb on ramp made by the first 18 inch spread.



REVIEW

QUESTIONS ?



Major Components



Engine:

- 6 Cylinder Diesel
- Turbocharged

330 Horsepower

**2-5 min. Cool Down & Warm Up
Period Required !**





Lubrication:

- Engine Oil
- Filter



15w40

- Dipstick

Hot & Cold check



Fuel System:

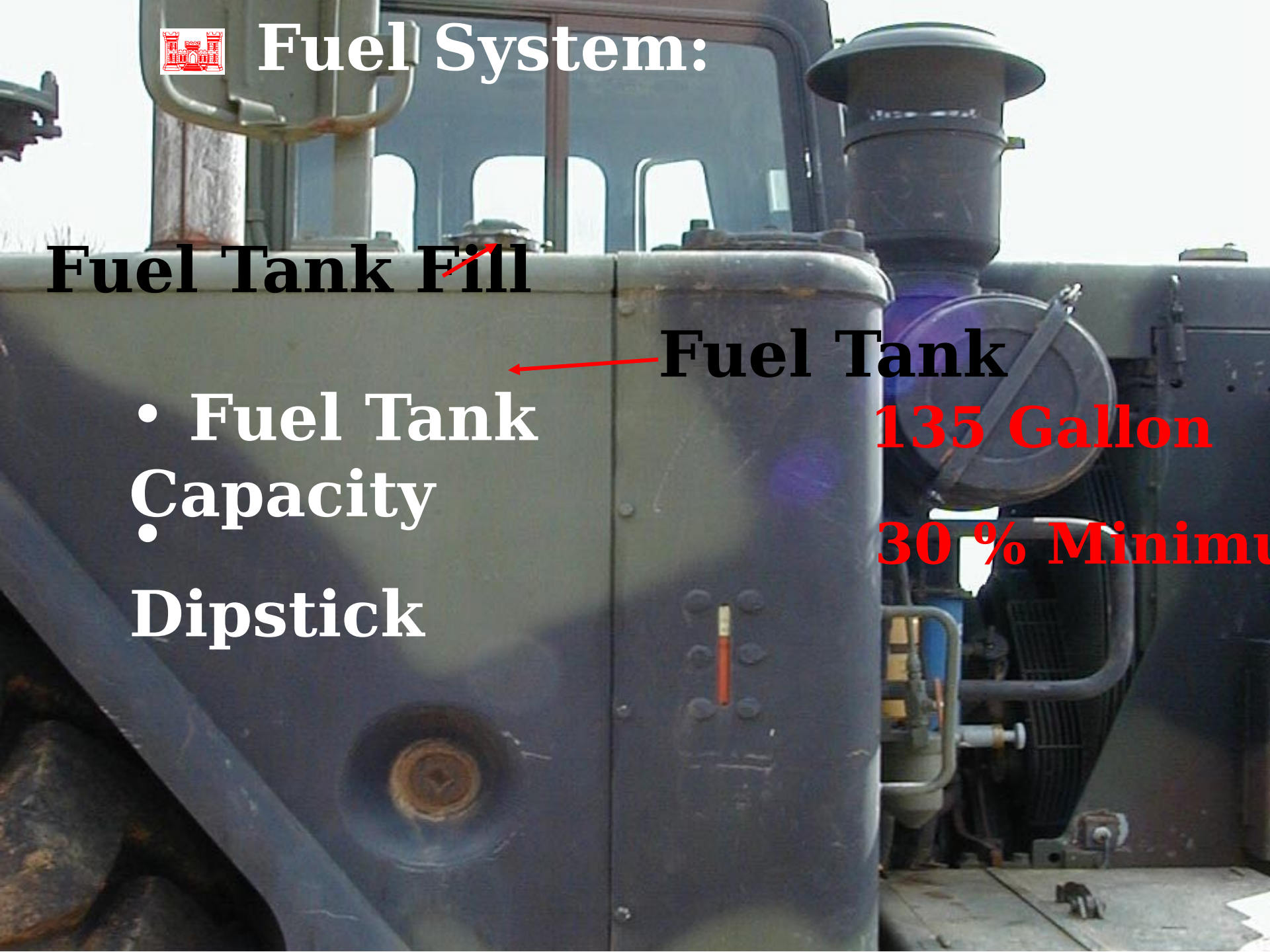
Fuel Tank Fill

- Fuel Tank Capacity
- Dipstick

Fuel Tank

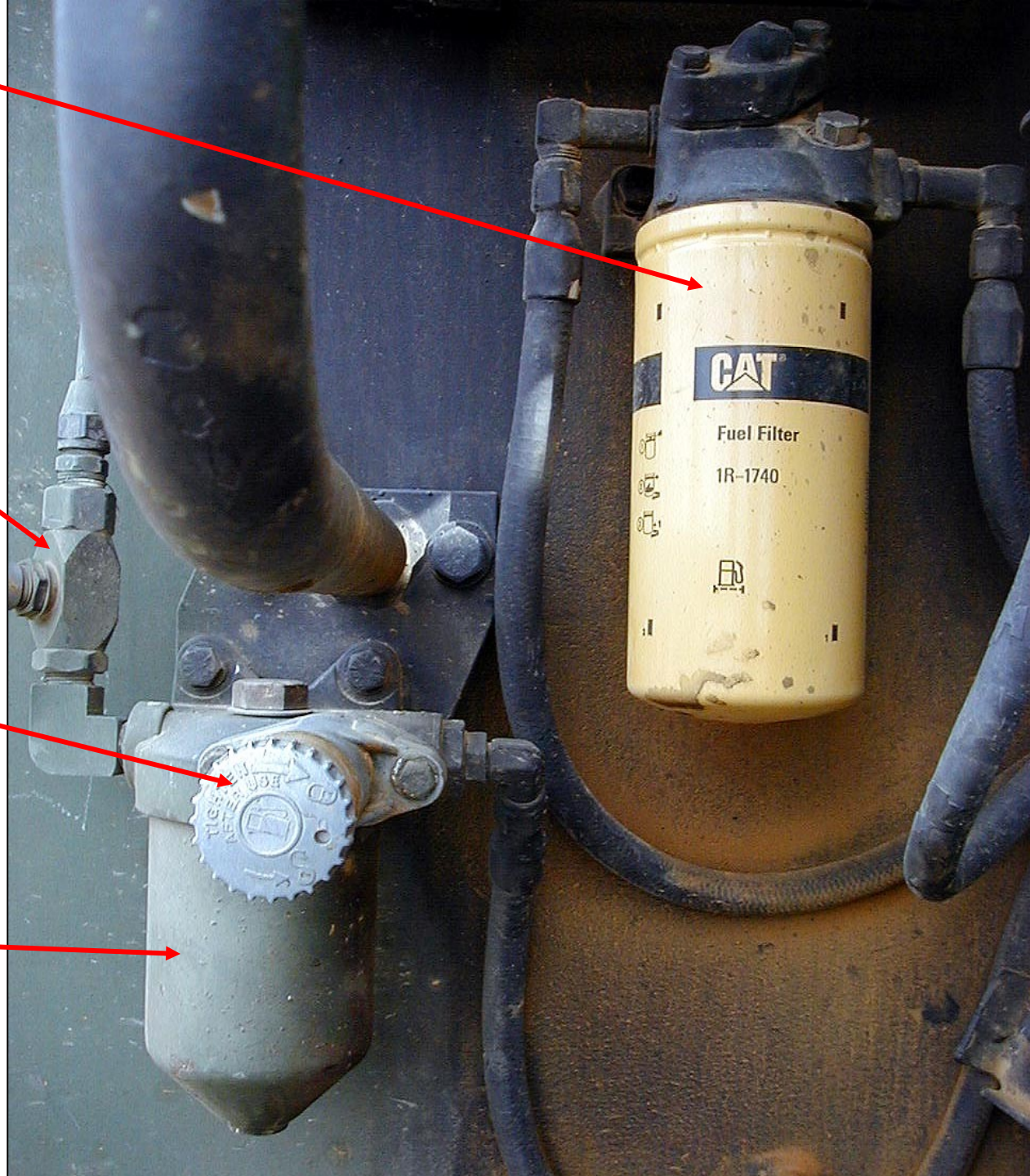
135 Gallon

30 % Minimum



**Secondary
Fuel
Filter
Fuel Cut
Off Valve**

**Fuel
System
Primer
Primary
Fuel
Filter**



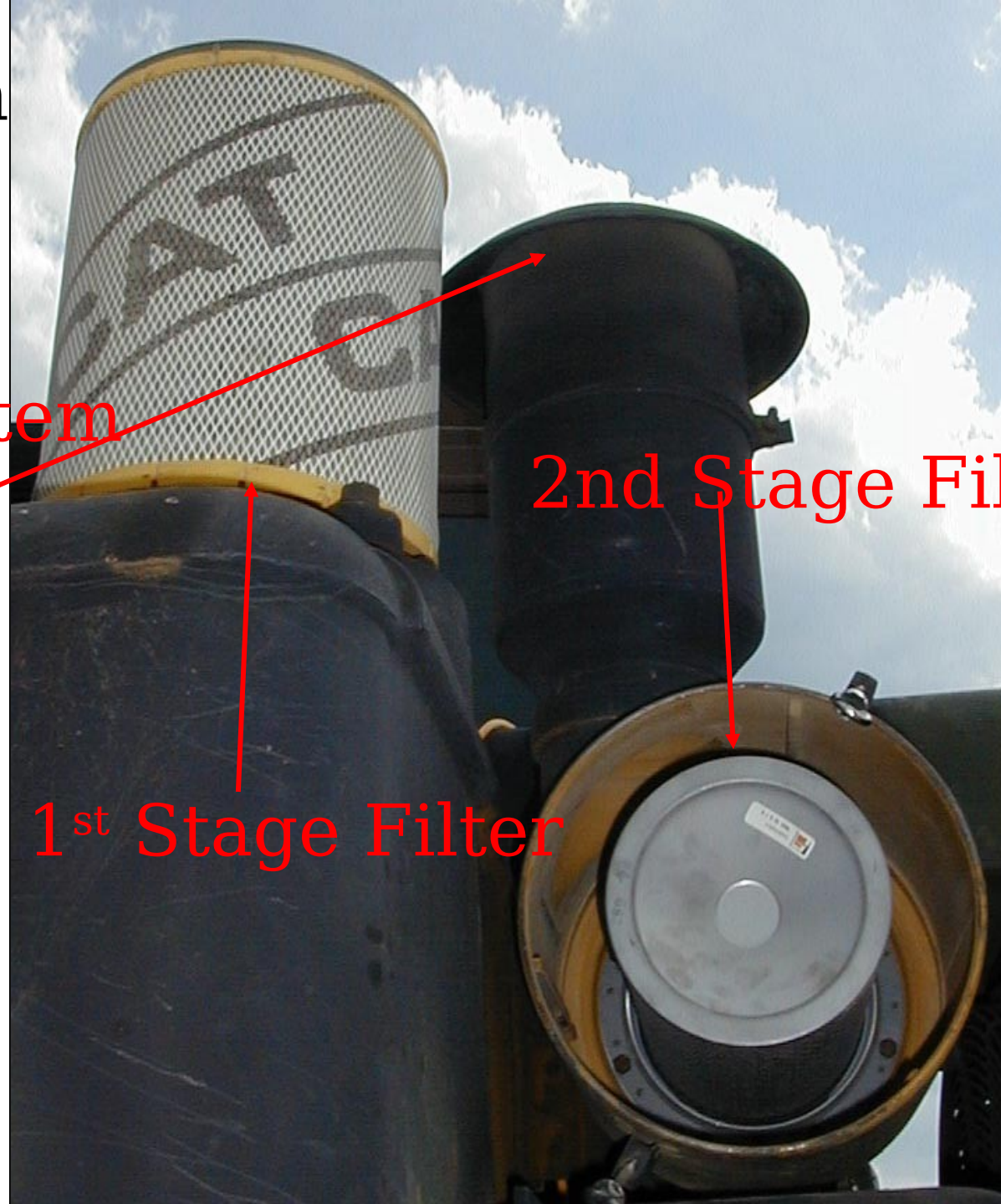


Air Induction System:

Air Filters

2 Stage system

Pre Cleaner



Air Induction System: Restriction Indicator





Cooling System:

- **Capacit**
• **Coolant**
• **Mix**
20 Gallons
50% Coolant
50% Water
- **Fan Assembly**
Self Adjusting
and Belts



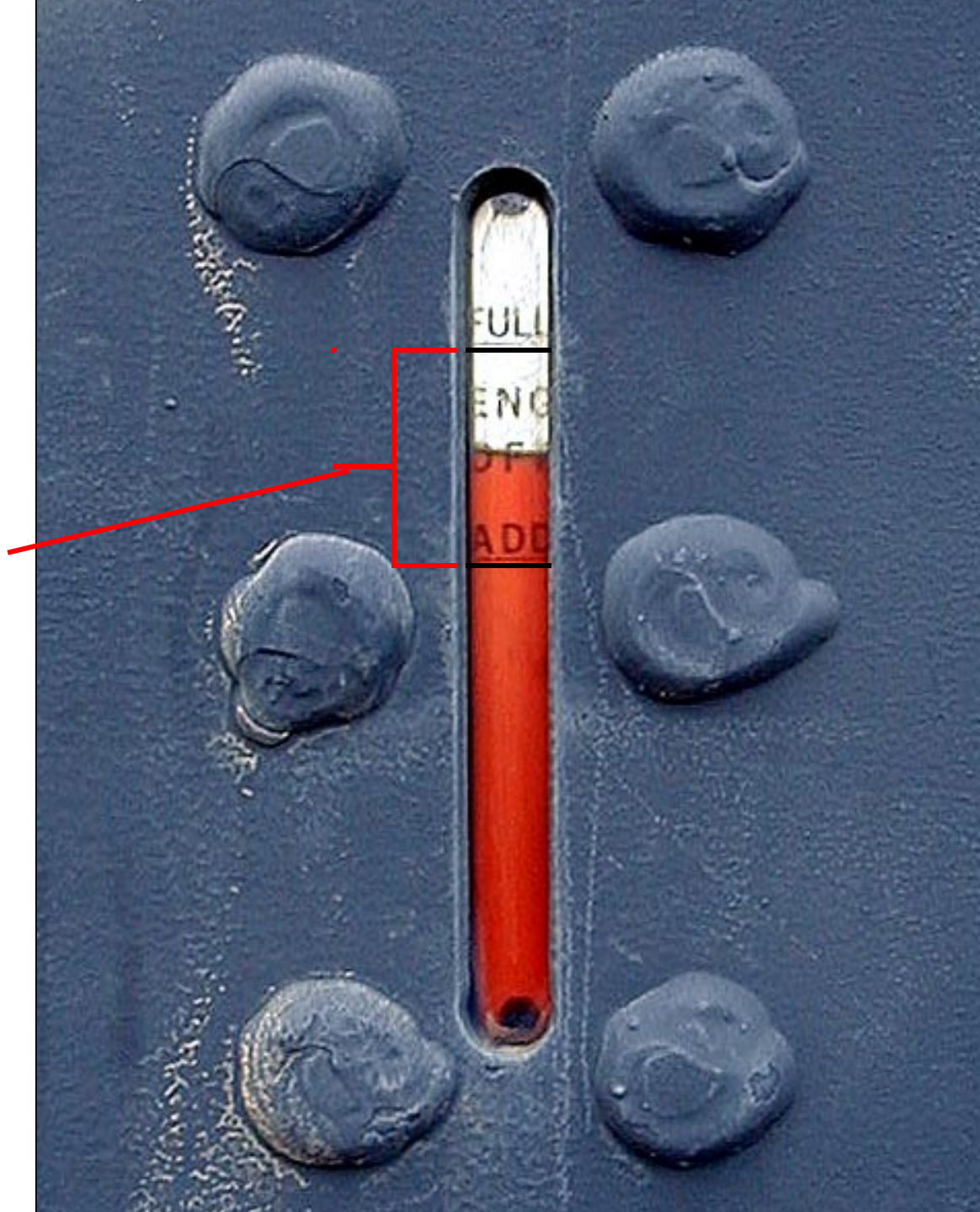
Hydraulic System:

- Pressurized
- 10 Weight Oil

Hydraulic Tank



**HYD
Sight
Gauge
When the
Engine is
Off the Fluid
must
Fall Between
the Lines.**



Semi Automatic Transmission



Shifts automatically at optimum



Chance of engine over speed is



Operator can concentrate on other controls.



Components life is increased.

Transmission Control Lever

1 Reverse Speed

8 Forward Speeds

Reverse 1st and 2nd
gears

are torque driven.
3rd through 8th are

automatic shift.
Downshift Inhibitor

Automatically Engaged



Two metal pedals are shown side-by-side. The pedal on the left has a rectangular base with horizontal ridges and a long, narrow stem. The pedal on the right is similar but has a slightly different shape. Red arrows point from the text labels to each pedal. The background is a blurred image of a vehicle's interior.

Differential Lock Pedal

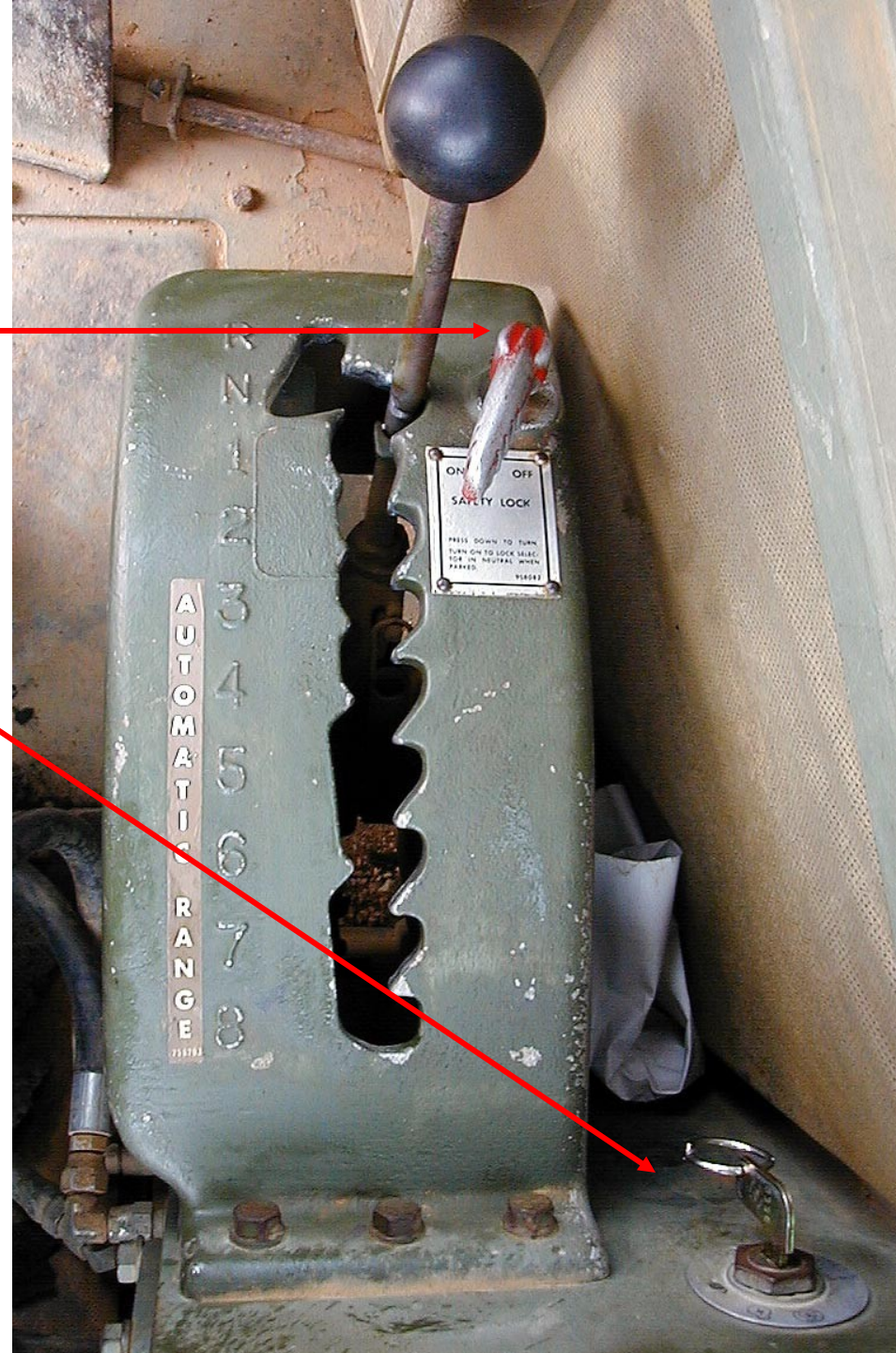
Locks the differential so both drive wheels pull.

Transmission Hold Pedal

Locks transmission in the selected gear.

Transmission Lockout

Battery Disconnect
Switch



Transmission Safety Lock

Holds transmission selector lever in neutral.



Battery Disconnect Switch

Disconnects all power from the battery.



Transmission Fluid Check

Oil should be
between
 $\frac{1}{4}$ and $\frac{1}{2}$ on the
sight
glass.
**15W 40 Weight
Oil**



Electrical system

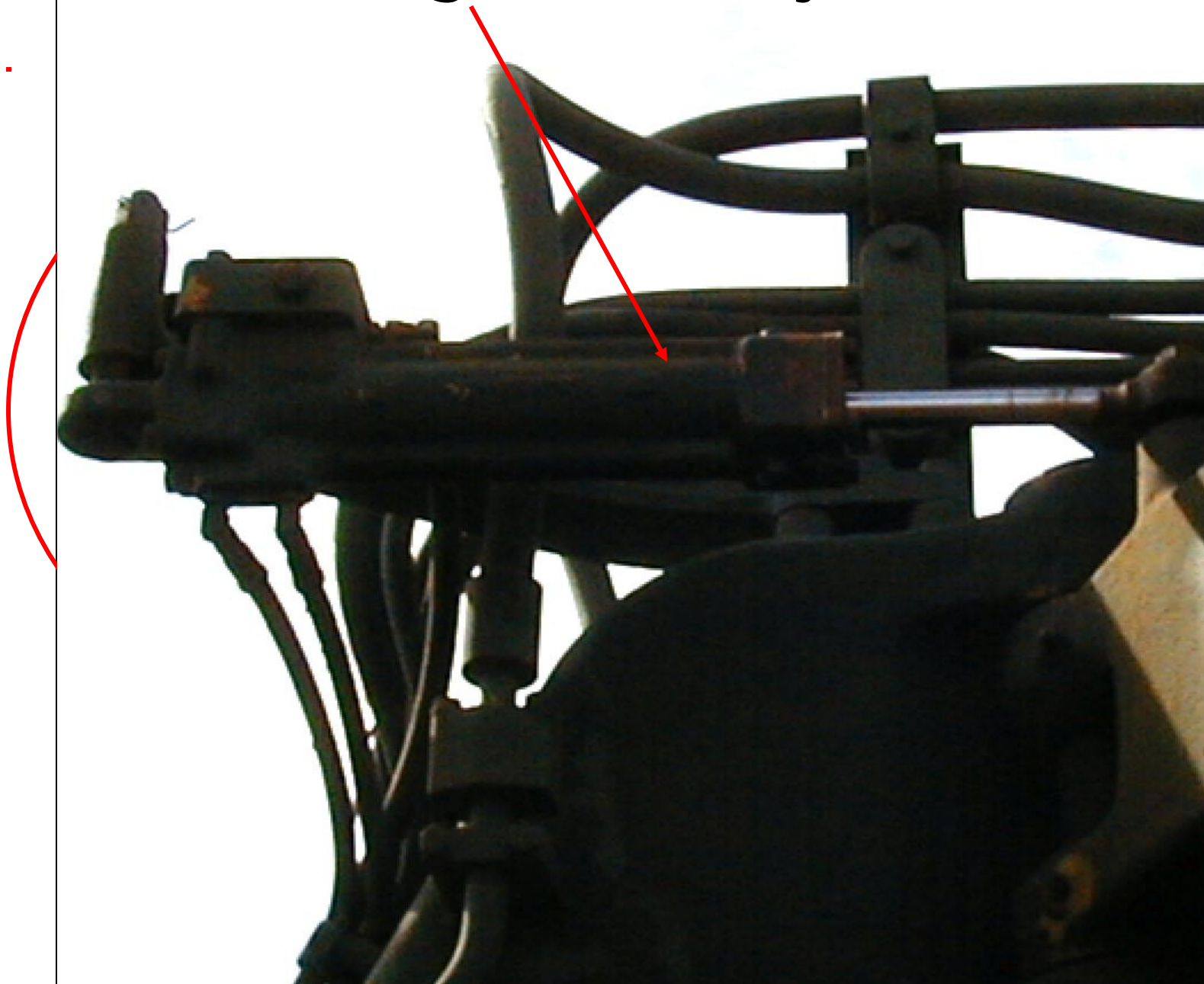


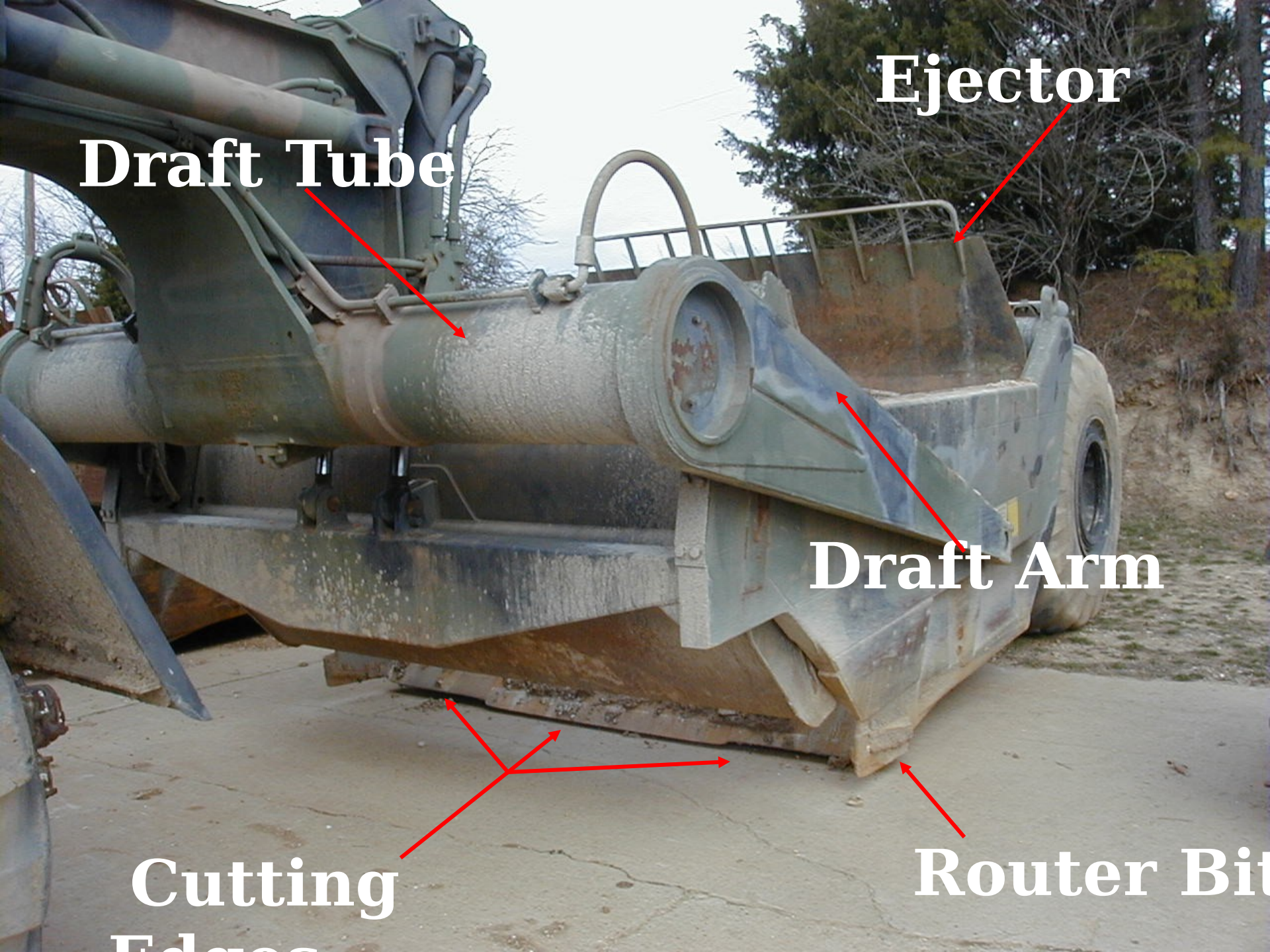
24 volts



**Slave
receptacle**

Steering Assist Cylinder





Draft Tube

Ejector

Draft Arm

**Cutting
Edges**

Router Bit



Tires and Wheels:



Directional

28 Ply



Air Pressure

Front 60

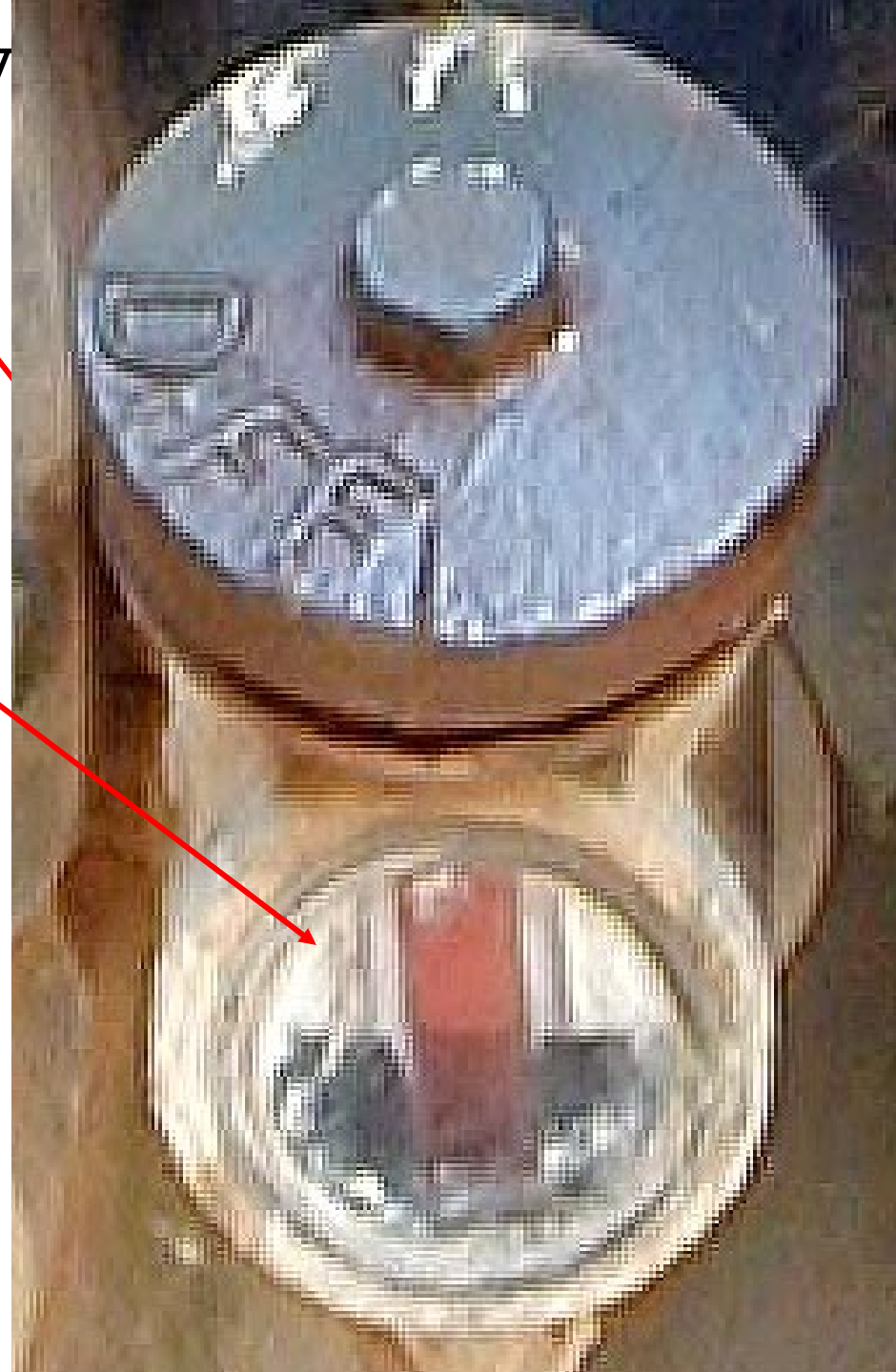
**psi
Rear 40**

psi

Differential / Final Drive Fluid Check

**Oil should
Completely
fill the sight
glass.**

**80/90 Weight
Oil**





REVIEW

QUESTIONS ?

Controls and Instruments



Bowl Controls

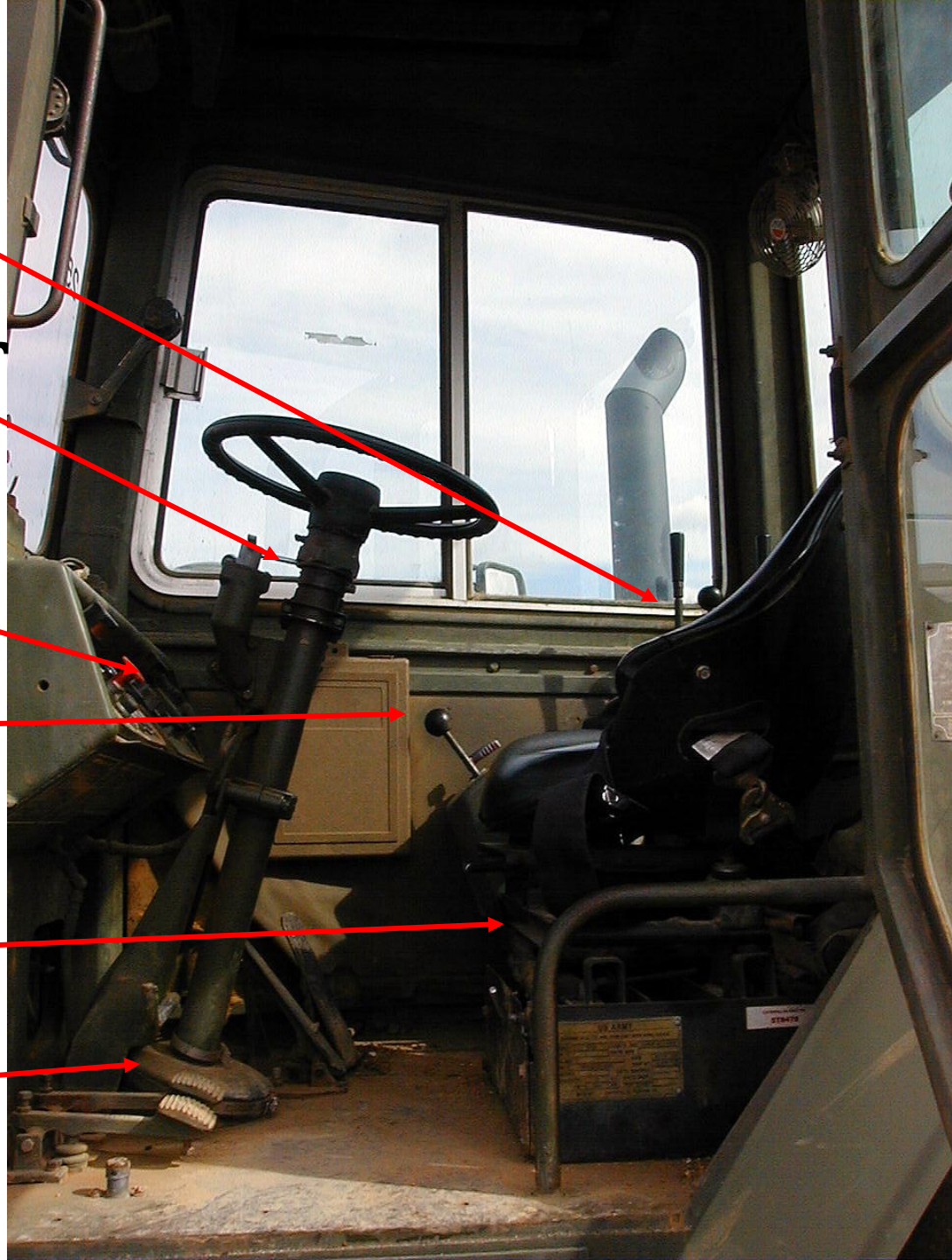
Retarder Lever

Dash Panel

Transmission
Selector

Seat Controls

Pedals

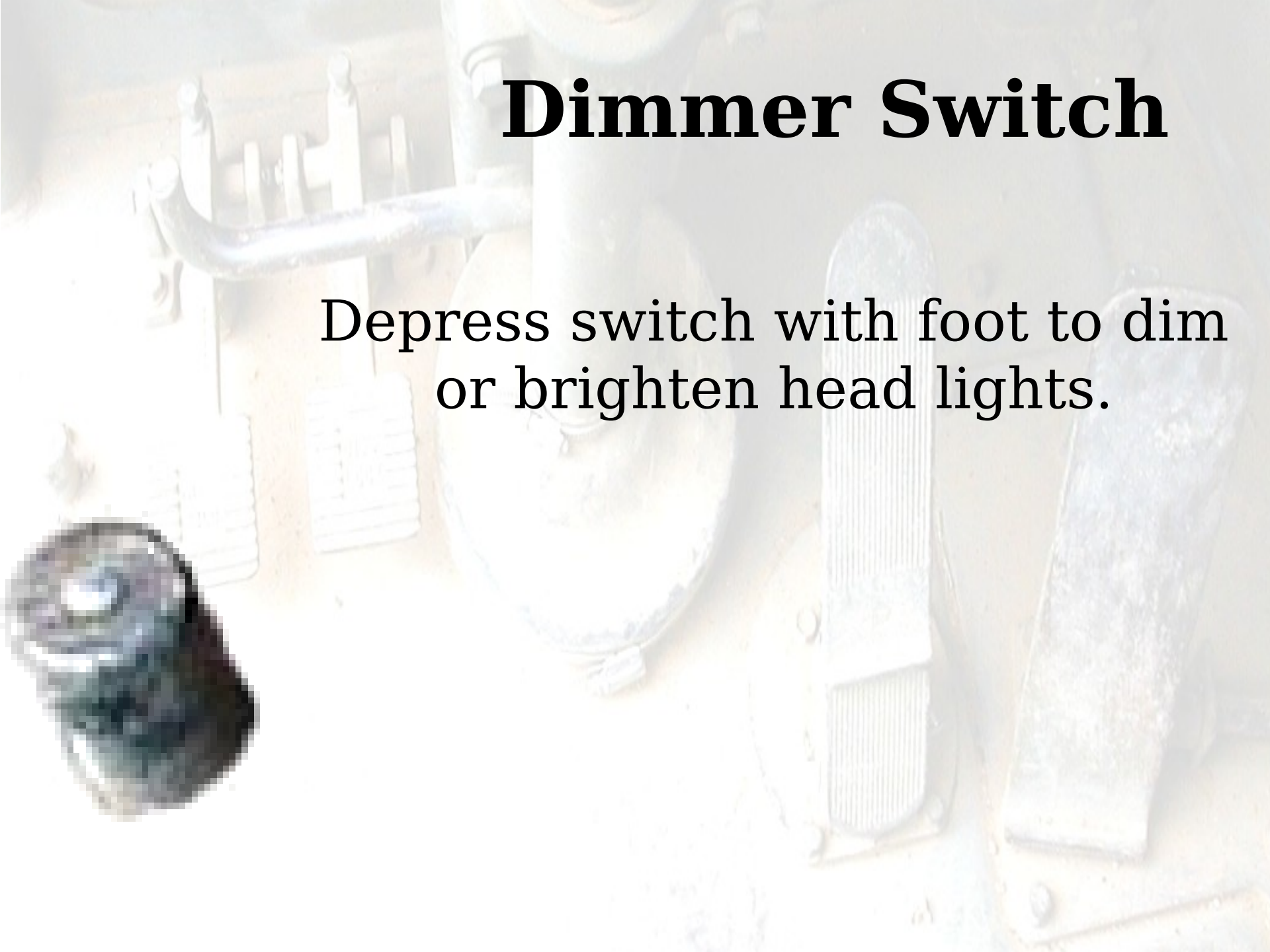


Floor Controls



Dimmer Switch

Depress switch with foot to dim
or brighten head lights.





The image shows two metal pedals side-by-side. The pedal on the left has a rectangular base with horizontal ridges and a long, narrow stem. The pedal on the right is similar but has a slightly different shape. Red arrows point from the text labels to each pedal.

Differential Lock Pedal

Locks the differential so both drive wheels pull.

Transmission Hold Pedal

Locks transmission in the selected gear.

Accelerator Pedal

Depress the pedal to accelerate
or to increase the RPMs.

Pull pedal up to cut off fuel.

Brake Pedal

Push to apply Air
brakes.



❗ **Excessive Pumping of Brakes Drain** ❗
Air Tanks

Engine Retarder Lever



Right Side of Dash Board



1. Start Switch



Start Switch

**Depress the switch and
turn it to the right to
start the engine.**



2. Tachometer



Tachometer

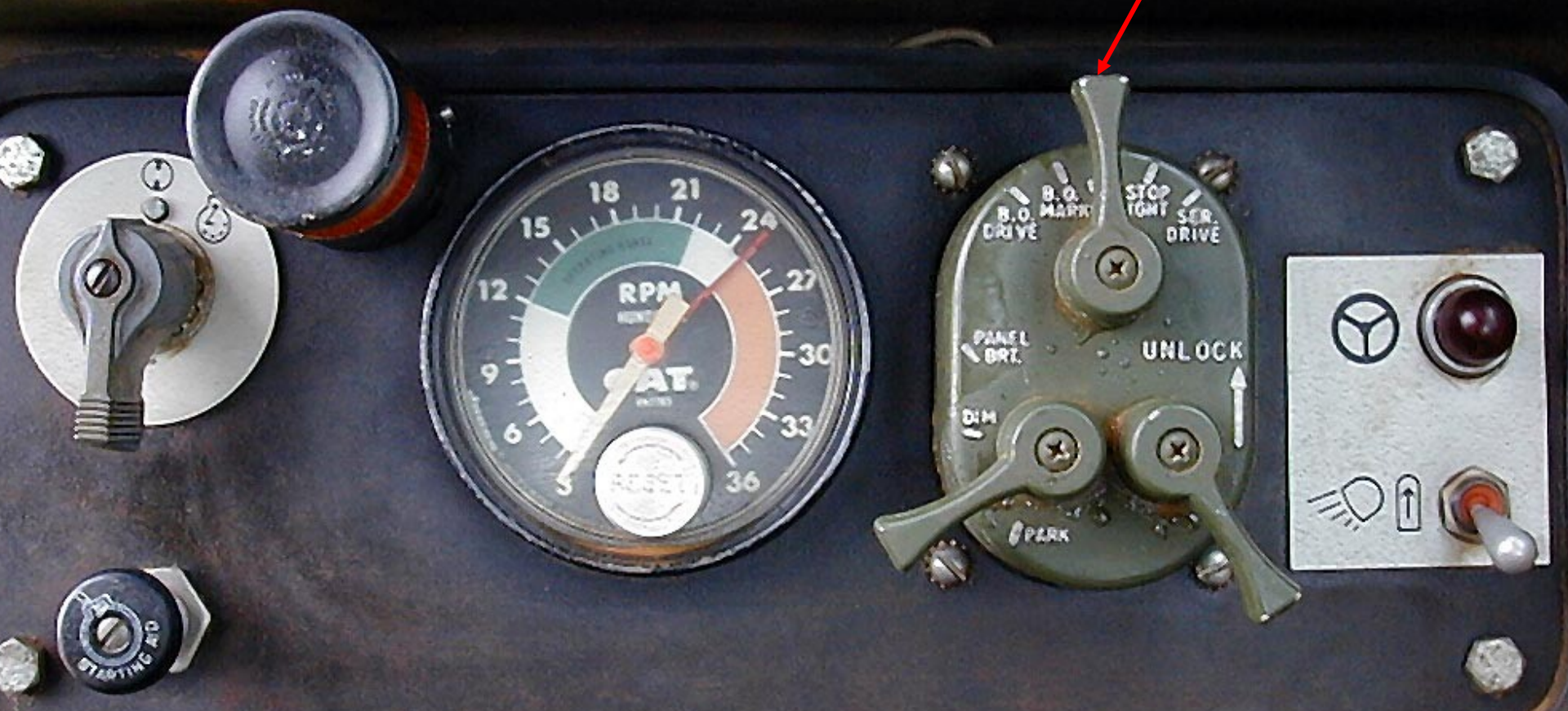
Keep the needle in the green for maximum performance .



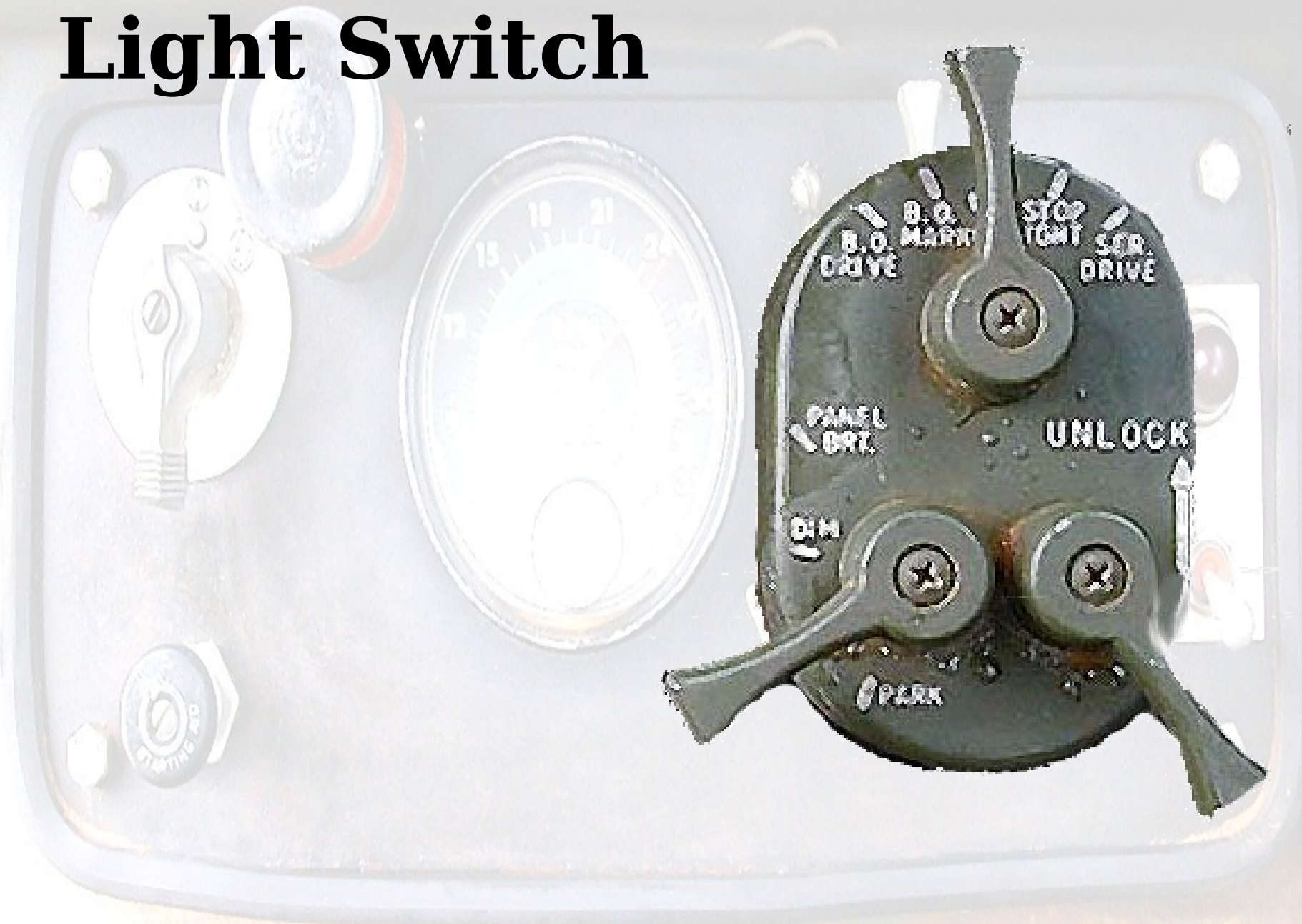
Never allow needle to Enter the Red



3. Light Switch



Light Switch



4. Supplemental
Steering Light

5. Flood Light Switch



Steering Warning Light

**Comes on when the
primary steering has
gone out.**

Flood Light Switch

**Flip the switch up to turn
on the flood lights.**





6. Starting Aide Switch

Starting Aide Switch

Depress for 3 to 5 seconds while engine is cranking.



Never Use on a Hot Engine



Left Side of Dash Board



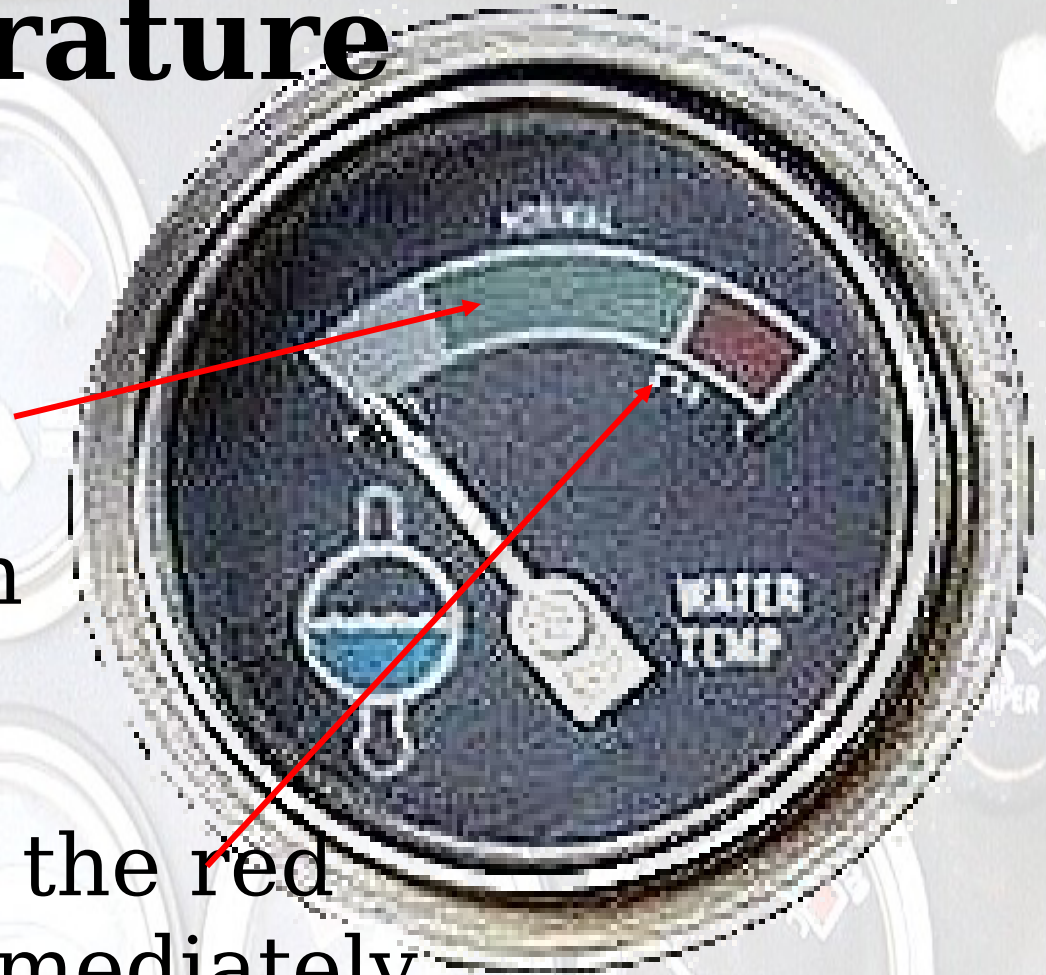
7. Engine Temperature Gauge



Engine Temperature Gauge

Engine should operate with the needle in the green.

If the needle enters the red shut down engine immediately and investigate.



8. Air Pressure Gauge



Air Pressure Gauge

After starting engine

allow the air

pressure

the pressure drops below

to build up to 90 psi the low air pressure

warning buzzer will

sound.



At 32 psi Air Brakes Automatically

Apply

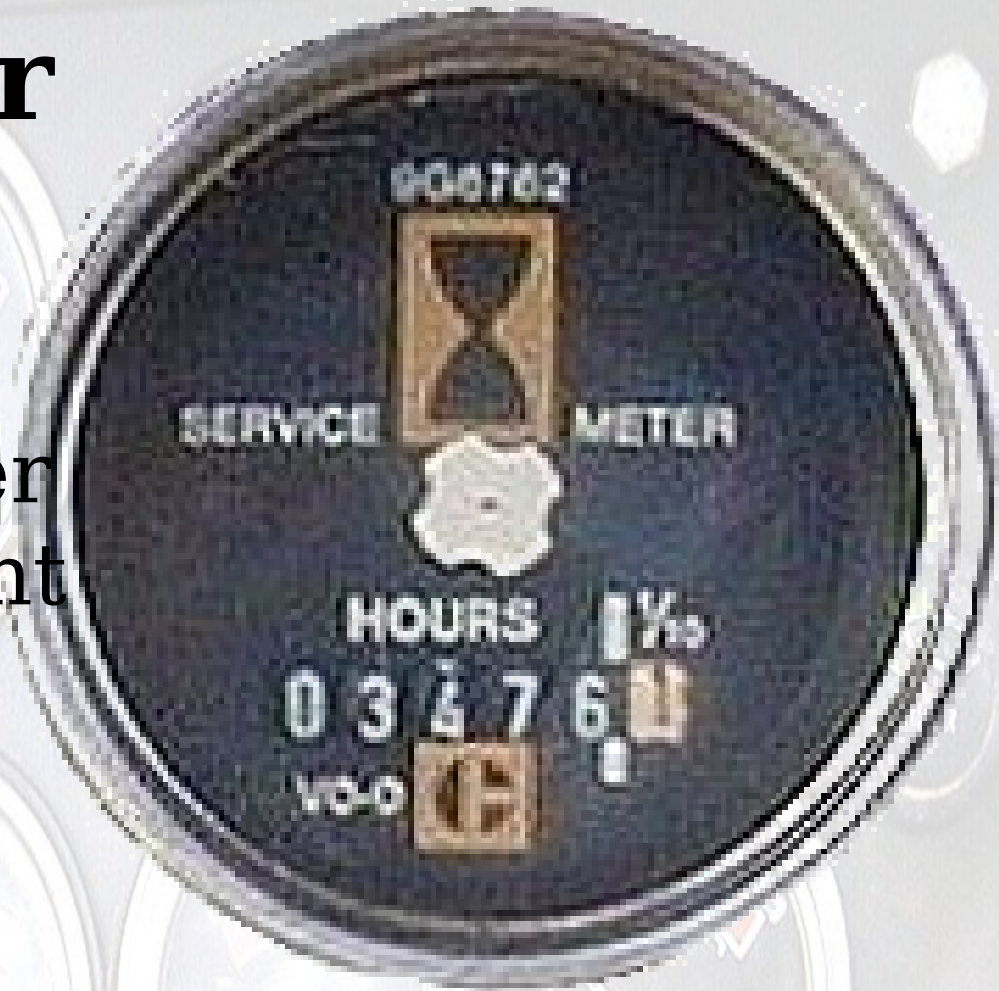


9. Hour Meter Gauge



Hour Meter

Measures the number of hours the equipment is operated.





10. Oil Pressure Gauge

Oil Pressure Gauge

Measures the oil pressure in the engine.

If the needle does not climb into the green after 10 sec., shut down engine and check the engine oil.





11. Ampmeter Gauge

Ampmeter Gauge

If the needle will go into the red after starting, check the charging system .





12. Torque Converter and Retarder Temperature Gauge

Torque Converter and Retarder Temperature Gauge

Should operate in the green, if needle goes into the red check the retarder handle to make sure it is completely disengaged.





3. Parking Brake Knob

4. Park Brake Indicator Light



**Park Brake
Indicator Light**
comes on when parking
brake is applied.



**Parking Brake
Button**
Pull to apply, hold
down until indica
lamp goes out to
release.



15. Horn Button

16. Windshield Wiper Control



17. Warning Horn Override

Warning Horn Override Button

Depress to override the
low air pressure warning
horn.





REVIEW

QUESTIONS ?

Operator Control Levers

Bowl Control Lever

Ejector Control Lever

Apron Control Lever

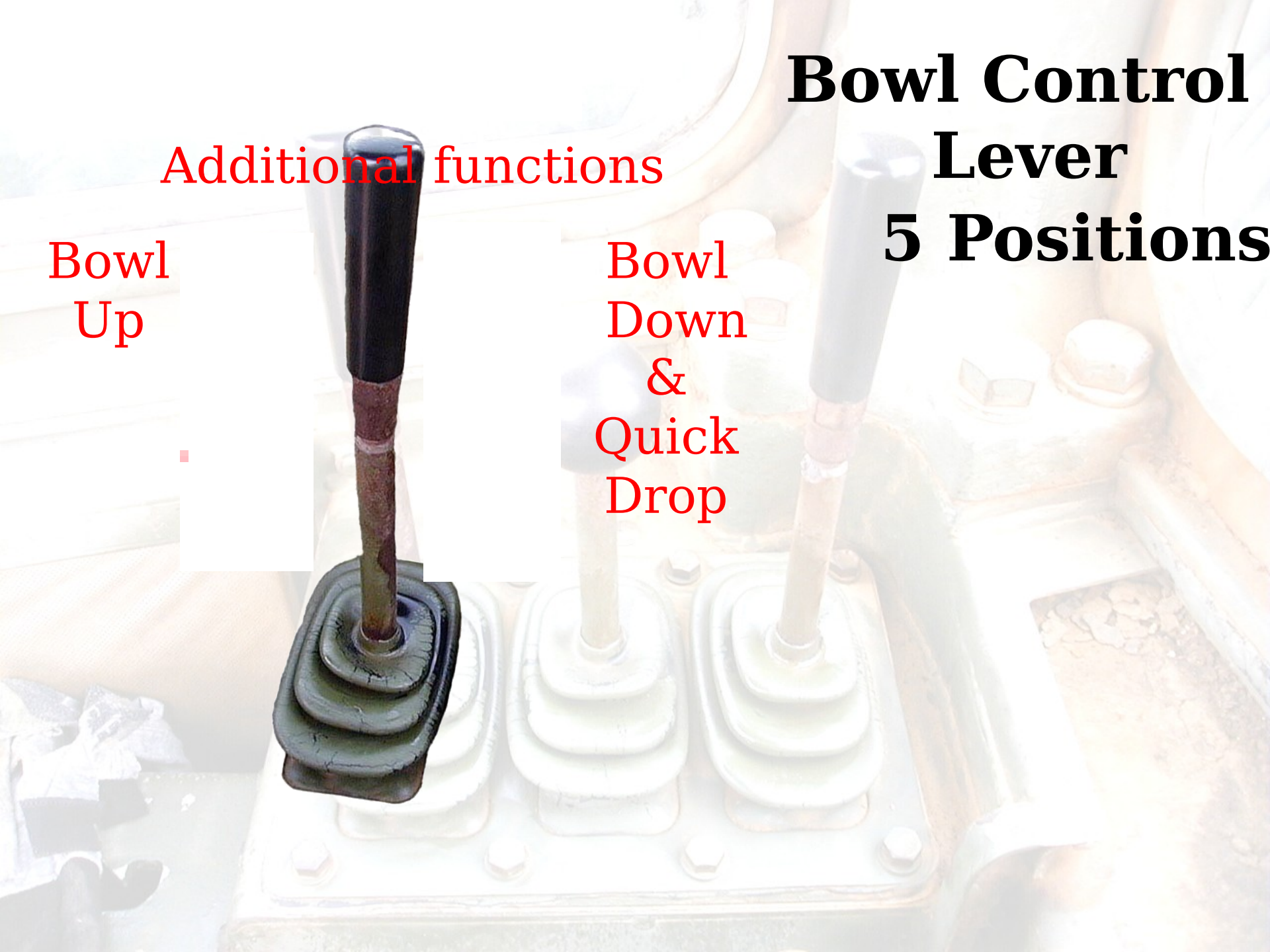


Bowl Control Lever 5 Positions

Additional functions

Bowl
Up

Bowl
Down
&
Quick
Drop



Apron Control Lever

Apron
Open

Apron Closed
&
Float Position



Ejector Control Lever

Ejector to the Rear
&
Automatic
Kick Out Return
(Locked)

Ejector to
the Front



Seat Adjustment

A close-up photograph of a car seat's adjustment mechanism. The image shows a black plastic adjustment lever with a spherical knob, which is part of a larger metal frame. The background is slightly blurred, showing the interior of a car with a white seat and other components.

Height

Forward and Backward

Parkline Position When Not Loaded



- 🏰 Park brake set
- 🏰 Transmission in neutral
- 🏰 Neutral safety lock engaged
- 🏰 Bowl on ground
- 🏰 Ejector forward
- 🏰 Apron closed and in

Parkline Position When Loaded



- 🏰 Park brake Set
- 🏰 Transmission in neutral
- 🏰 Neutral safety lock engaged
- 🏰 Bowl on ground
- 🏰 Ejector to the rear
- 🏰 Apron closed and in

Travel Position (Empty)



 Empty



Bowl 4-6" off the ground



Apron closed and in float



Ejector to the front

Travel Position (Loaded)



Loaded



Bowl 4-6" off the ground



Apron closed and in float



Ejector to the rear

Cut Set-UP



Ejector to the rear



Bowl 1" off the ground



Apron open to three knuckles 1



REVIEW

QUESTIONS ?



Production techniques



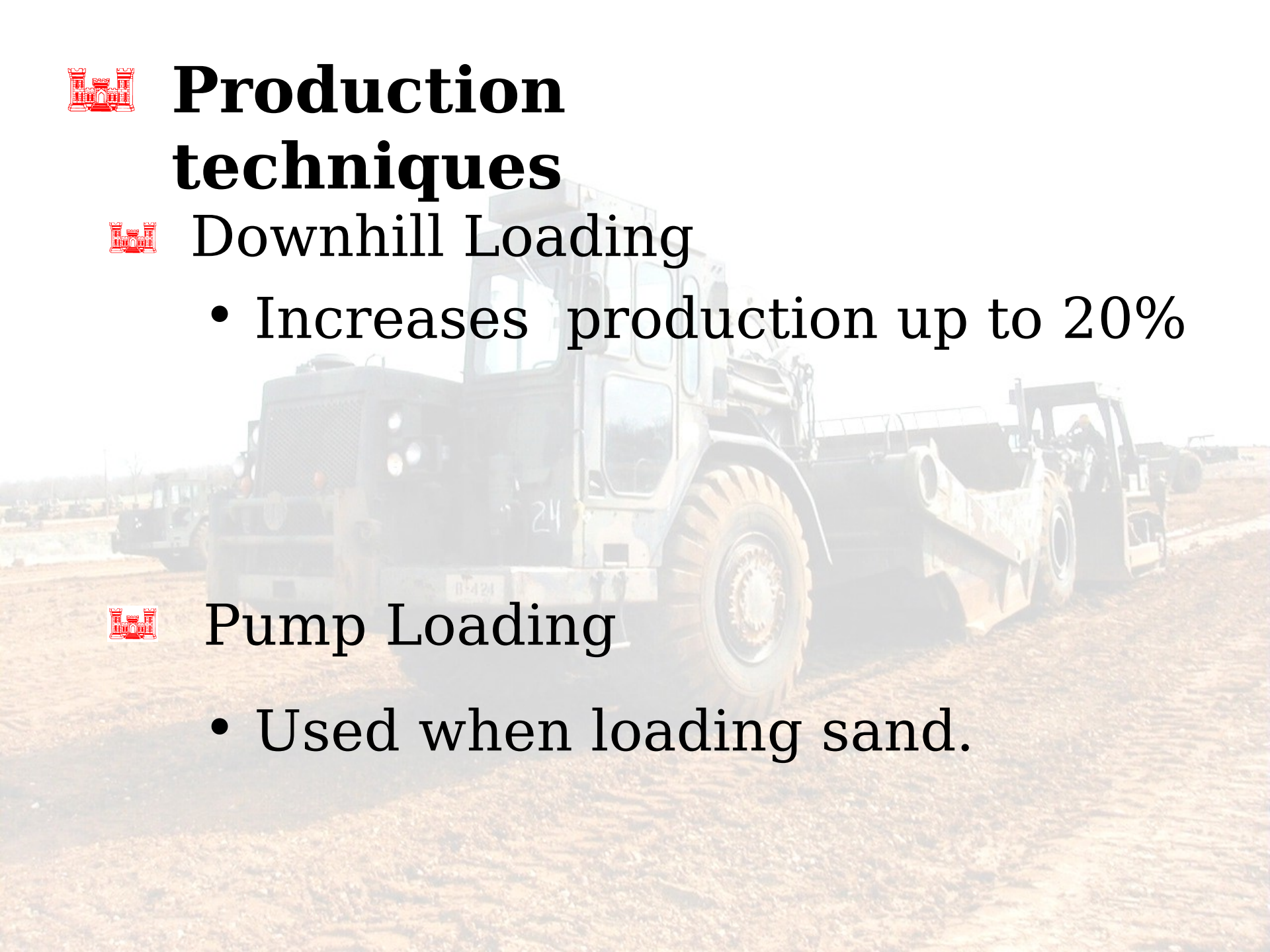
Downhill Loading

- Increases production up to 20%



Pump Loading

- Used when loading sand.





Straddle Loading

Used to increase
production on
third pass.

The island between the first two cuts must
be no wider than the distance between the
Scraper's wheels



Chain Loading

- Long continuous cut with 2 or more s



Shuttle Loading

- Short cuts in both directions.



Backtrack Loading

- Short cuts, Impractical to load in both directions.

Dozer Pusher Assistance



Dozer Pusher Assistance





REVIEW

QUESTIONS ?



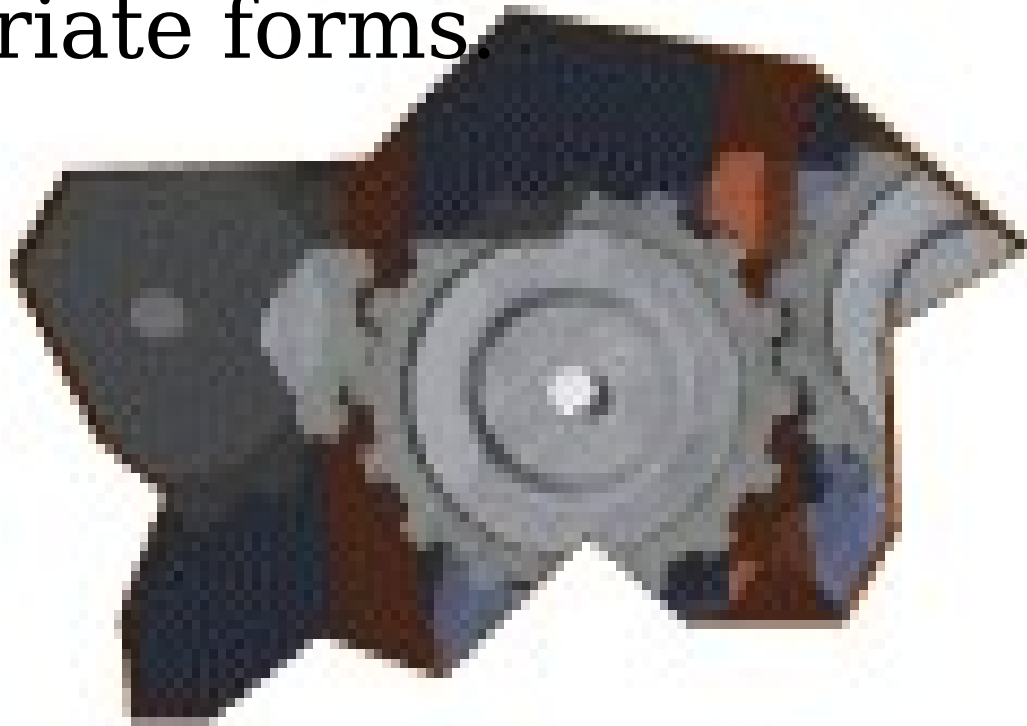
Preventive



Maintenance:
All preventive maintenance checks will be done prior to the starting of all equipment.



Report all problems you find to your supervisor, and annotate on appropriate forms.





**Once your mission is complete
after operation checks.**

- **Dirt, grease,oil and debris may c
serious problems. Clean as you v**
- **Check all bolts, nuts and screws
sure they are not loose, missing,
broken.**
- **Look for cracked or broken wire**



Leak Definitions:



Class I

- Seepage of fluid, as indicated by wet discoloration but not great enough to form drops.



Class II

- Leakage of fluid great enough to form a film but not enough to cause drops to drip from the item being checked.



Class III

- Leakage of fluid great enough to form drops that fall from the item being checked.



Lubrication:



Lubrication will be done at prescribed intervals (Lube Chart), and when:

- Working in dusty conditions.
- Equipment having worked with attachment under water.



When lubricating always remember:

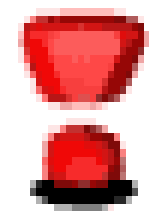
- Do not lubricate items that don't need it.
- Wipe off all grease fittings before and after lubricating.
- Keep lubricants in their container, and do not add foreign matter.



REVIEW

QUESTIONS ?

SAFETY



Y



Do a 360 walk
around  Prior to Mounting

 After Dismounting



**Wear hearing protection,
hard hats
and seat belts at all times**



**when
Maintain 3 points of contact
operating equipment.
when**

**mounting and dismounting
equipment.**

Facing Equipment



Adjust Mirrors



Keep Scraper under control at all times !



Safety First



ENVIRONMENTAL

Once you have completed the project, restore the area as close as possible to its original state.

The operator must constantly be aware of any equipment leaks, and correct them before they become a hazard.



Line Up on the
Instructor

Center the equipment
on the ground guide



Cut

Take foot off of the
Accelerator.

Look over the right
shoulder at cutting
edge.

Gently lower the b
into the ground.

**NEVER APPLY THE
BRAKES.**



Excavating a load with dozer assistance

1. Remove right foot from the throttle
2. Look over right shoulder.
3. Lower bowl 2-4 inches into the ground
4. Place left foot on D/L and T/H Pedals.
5. ~~Slowly push RPM's to 1200 to 1500~~
Slowly push RPM's to 1200 to 1500
6. Place left foot back on "L" peg. (after)
7. Full throttle complete additional fuel
8. Place apron in float position. (after apron)
9. Lower or raise bowl to 4-6 inches. (after)

Spread

4 to 6 inch Bowl Height







Leveling Position

- Bowl $\frac{1}{2}$ the height of windrow
- Ejector to the front
- Apron open and all the way up



Leveling



Insure stinger bit is reversed, if so



Haul road and Job site
Maintenance





REVIEW

QUESTIONS ?